TRANSLATION

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Device for the packing of a product in liquid, semiliquid, soft or finely pulverous form.

The device has an arrangement for the generating and packing of portions of equal volume or weight and consists of two pairs of endless belts (19, 31) provided with clamping members (13, 22, 23; 12, 34), between which belts a envelopement (7) containing the product to be packed is moved. Between each of the belts of each pair provided with clamping members there is arranged a middle, small clamping member. The two middle belts run between two parallel, smooth plates (36, 37) the spacing of which from one another is variable. In this manne it is possible to vary the volumes of the portions formed in the envelopment (7) between successive clamping members.

Specification

The invention relates to a device for the packing of a product in liquid, semiliquid, soft or finely pulverous form in flexible envelopments of plastic according to the generic term of patent claim 1.

In the hitherto known devices of this type, such as are described, for example, in U.S. patent 35 42 570, the arrangements for the forming and dimensioning of the filled envelopments consist of two endless belts, to which there are fastened fingers which form the members for clamping-in and separating. The packed volume is determined there by the spacing between two successive fingers and by the thickness of these fingers, i.e., by the spacing between the two belts. Now it is demanded in general, however,

that in the packing a certain weight be maintained, for example in the case of a packing of cheese to ensure that the individually packed slices of cheese have a weight of 30 g, this weight determining the selling price. This weight, however can vary for various reasons, in which context a difference of one gram per cheese slice per day with a single device can make a difference of about plus or minus 10 kilograms. With the hitherto known devices a correction of the volume requires the stopping of the installation and the changing of the belts provided with fingers.

Underlying the present invention is the problem, in a device of the type given in the generic term of claim 1, at any time to adjust the volume, i.e. the packed weight, or to readjust it, without its being necessary to interrupt the operation of the device.

This problem is solved according to the invention by the features given in the characterizing part of patent claim 1.

The arrangement for adjusting the spacing of the smooth plates can consist of a sim .le, manually operatable screw, which acts on one of the two plates which is movably mounted, while the other plate is mounted in fixed position. This arrangement can be controlled in a simple manner by a balance which weighs the filled envelopments, in order in this manner to obtain an automatic, continuous regulating of the packing weight.

Other suitable embodiments of the invention are yielded from the dependent claims.

The invention is explained in detail with the aid of the drawings in an example of execution.

Fig. 1 shows a schematic view of the main parts of a packing device according to the invention,

Fig. 2 an enlarged detail view of the arrangement for forming and dimensioning the filled envelopments,

Fig. 3 the upper part of the arrangement represented in Fig. 2, on an enlarged scale,

Fig. 4 a section along the line IV-IV according to Fig. 3 and

Fig 5 a section along the line V-V according to Fig. 4.

The device represented schematically in Fig. 1 has a generally cylindrical tubular arrangement 1, into which there extends a feed tube 2 fed from a supply funnel 3 with the product to be packed. The packing material consists of a foil 4, for example of polypropylene, which is unwound from a coil 5. This foil runs over a deflecting roll 6 and then over the upper edge of the vertically oriented tube forming the arrangement 1 mentioned, into which this foil is drawn downward to form the envelopment.

There the two edges of the foil 4 are superposed and are welded inside the arrangement 1 with the aid of a heating body, and namely just before the formed envelopment is filled with the product to be packed, it being, for example, a matter of melted cheese with a temperature of 80°C. The welding of the envelopment occurs, therefore, above the lower end of the feed tube 2.

In the event that the product to be packed is a cheese which is to be packed in slice-form portions, the lower end of the feed tube 2 is flattened, and the envelopment 7 of polypropylene formed fits itself to the form of the end of the feed tube, as illustrated at 8.

The envelopment 7 which contains the product to be packed passes then into an arrangement 9 which forms exactly dimensioned portions of the product to be packed, i.e. portions of the same weight, and, as shown in detail in Fig. 2, consists of two endless belt arrangements 10 and 11, on which there are fastened clamping members 12 and 13. These clamping members 12 and 13 , in the steady circulation of the belt arrangements 10 and 11 are pressed against each other, whereby the envelopment 7 is clamped in and the products is subdivided into portions 14, as is described for example in US patent 35 24 570. The chain of the cohering enveloped portions 14 passes then between two cylinder 15 and 16 (Fig. 1), which bring about a warm welding of the envelopment between the portions 14, in which process the drive of this chain of the enveloped portions 14 is accomplished by the two belt arrangements

10 and 11. The packed portions 14 are thereupon cooled and then separated from one another.

Below, the arrangement 9 mentioned is described in detail with the aid of Figs. 2 to 5. The two belt arrangements 10 and 11 consist in reality in each case of three individual belts. With the aid of Figs. 4 and 5 the belt arrangement 11 is described in the following. It has a middle toothed belt 17, which is relatively wide, and has a smooth surface, and, on both sides of this middle belt 17 in each case a narrow toothed belt 18 and 19. These three toothed belts 17, 18 and 19 are mounted on two toothed rollers 20 and 21, of which the one, preferably the roller 21, is driven by a motor (not represented).

To the toothed belts 18 there are fastened the already mentioned clamping members 12 and 13 in the form of transversely running platelets or lamellae of steel, which are arranged at a regular spacing from one another. These clamping members are designated in Figs. 2 to 5 also with the reference numbers 22 and 23, respectively 32 to 35. When these platelet-form clamping members are not burdened, they have a slighly curved form, such as is shown in Fig. 4 for the platelet 22. All the platelet-form clamping members are fastened to the belts with the aid of flanges 24 and 24', which lie underneath these belts and are arranged in such a way that they enclose a tooth of

the toothed belt concerned. In order not to hamper the course of the belts on the toothed rollers, some of the interspaces between the teeth of the toothed rollers are enlarged, as is represented in Fig. 3 for the tooth interspaces 25, 26, 27 and 28 of the roller 20.

The other belt arrangement 10 is constructed in an analogous manner and has a belt 29 like the belt 17 and on both sides of it in each case a narrow toothed belt 30 and 31, which carry the platelet-form clamping members 32, 33, 34 and 35, which correspond to the platelet-form clamping members of the belt arrangement 11 and have the same spacing from one another as these. The platelet-form clamping member 32 is to be seen in Fig. 5.

When the middle belts 17 and 29 lie opposite one another in their circulation, then they run between two parallel metal smooth plates 36 and 37. The plate 37 is mounted in fixed position, and its smooth surface on which the belt 29 slides along occupies a position such that this belt 29 extends in a straight line between its toothed rollers 38 and 39 (Fig. 2), of which the one, preferably the roller 29, is driven synchronously with the roller 21. The other plate 36, however, is movably mounted with the aid of two rods 40 and 41, which are slidable in fixed guides 42 and 43 arranged on a carrier 44. The plate 36 is connected, furthermore, with a shaft 45 which is turnably mounted on this plate 36 and has a part 46 provided with a thread which passes through a threaded opening of a fixed part 47 of the carrier 44.

The outer end of the shaft 45 is provided with a grip 48, for example in the form of a small hand wheel, which permits the turning of the shaft 45. By turning this grip 48 it is possible, therefore, to adjust the movable plate 36 perpendicularly to the plane of the fixed plate 37, ie.e to reduce or enlarge its distance from the fixed plate 37.

The arrangement described operates as follows: When the tubular envelopment 7 filled with the product to be packed arrives between the two middle belts 17 and 29, then it is clamped between two platelet-form clamping members 35 and 49 (Fig. 3). By reason of their curvature these platelet-form clamping members pressed against one another over their entire length are snugly laid against one another from one end to the other and thereby clamp it the envelopment 7 uniformly over its entire width. When the driven envelopment 7 runs onward, it is thereupon the platelet-form clamping members 22 and 34 which are pressed against one another and in this manner form a portion 14, whereupon the following portion 14 is formed by the following platelet-form clamping members 23 and 33 (Fig. 3), etc.

Fig. 5 shows another platelet-form clamping member 49', which is fastened to the belts 18 and 19 and cooperates with the clamping member 32. The product contained in the envelopment 7 is compressed and in the process has the tendency to spread apart the two belts 17 and 29. These belts, however,

are held back by the plates 36 and 37, on which they slide. The spacing of the belts 17 and 29 and consequently the spacing of the plates 36 and 37 determines, therefore, the volume of the portions 14 formed between two pairs of successively following platelet-form clamping members. As the plate 36 is removed more or less from the plate 37, this volume can be modified correspondingly. It is directly possible to actuate the shaft 45 by a servo motor which is controlled by a balance which weighs the individual portions 14 one after the other after their separation.

If the material used for the foil 4 or the envelopment 7 is of such nature that it can slide directly on the plates 36 and 37, polished or lined with a self-lubricating plastic material, then the middle belts 17 and 29 can also be omitted. That is especially the case when the packing is done in a cold state.

It is also possible for the two plates 36 and 37 to be movably mounted. They can, in particular, by slidable in common in such a manner that the thickness of the enveloped portions 14 is distributed uniformly on both sides of the plane of symmetric of the arrangement 9 serving for the forming and dimensioning of the portions.

Patent Claims

1. Device for the packing of a product in liquid, semiliquid, soft or finely pulverulous form in flexible envelopments of plastic, which are formed from a tubular envelopment (7), with an arrangement (1, 2, 3) for the continuous filling of this tubular envelopment, with an arrangement (9) for the forming and dimensioning of enveloped portions (14), consisting of parallel, driven belt arrangements (10, 11) the belts of which are provided with clamping members (12, 13) arranged at a uniform spacing from one another, which serve for the separating and clamping-in of the tubular envelopment (7) and between which this envelopment is moved and clamped in for the purpose of packing the enveloped portions, with an arrangement for limiting the thickness of these enveloped portions and with an arrangement for driving the chain consisting of the connected enveloped portions (14), characterized in that the arrangement (9) for the forming and dimensioning of the portions has at least two parallel smooth plates (36, 37), between which the tubular envelopment (7) is moved, that at least one of these plates is mounted to move perpendicularly to their plane, that two pairs of belts (18, 19, 30, 31), preferably of toothed belts, are arranged on both sides of each of these plates (36, 37), and are provided in each case with clamping members (22) serving for the separating and that there are provided an arrangement (21, 39) driving the belts as well as an actuating member (45) serving for the adjustment of the spacing of the plates (36, 37) mentioned.

2. Device according to claim 1, characterized in that the arrangement (9) mentioned for the forming and dimensioning of enveloped (wrapped) portions presents, furthermore, a pair of driven belts smooth on their outside, which lie opposite one another substantially rectilinear sections between which the two smooth plates (36, 37) mentioned are arranged.

3. Device according to claim 1 or 2, characterized in that the clamping members (22) serving for the separation consist of elastic platelets in the form of lamellae of steel, which are fastened with their ends to each of the belts of one of the first-mentioned belt pair (18, 19; 30, 31).

4. Device according to claim 3, characterized in that the elastic lamellae are curved in the unburdened state and that they are pressed against one another with their convex sides, with clamping in of the tubular envelopment (7).

5. Device according to claim 4, in which the belts mentioned consist of toothed belts, characterized in that the clamping members formed by elastic lamellae (22) are fastened to the belts with the aid of flanges (24) which enclose a tooth of the toothed belts on the belt inside, these clamping members being preferably riveted to the flanges mentioned, and that at least one interspace between the teeth of the toothed rollers conducting the toothed belts is enlarged (25 to 28) in such manner that the flanges mentioned can pass unhampered.

6. Device according to any of claims 1 to 5, characterized in that the actuating member (45) for changing the spacing of the two smooth plates (36, 37) mentioned consists of a turnable shaft (45) with a threaded part mounted on the movable plate (36), which is screwed into the threaded opening of a fixed part (47).

7. Device according to any of claims 1 to 6, characterized in that the member for changing the spacing of the two smooth plates (36, 37) mentioned is automatically controllable by a balance which weights the weight of the packed, enveloped (wrapped) portions.